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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
FIGUEROA, JOHN J	

ART UNIT	PAPER NUMBER
1712	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/714,548	BENTON ET AL.	
	Examiner	Art Unit	
	John J. Figueroa	1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Nov. 14, 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13,14 and 17-43* is/are pending in the application.

4a) Of the above claim(s) *21-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13,14,17-20 and 34-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *March 22, 2004*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *Jan. 20, 2006* .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 13, 14, 17-20 and 33-43, drawn to a water soluble copolymer and composition comprising thereof and an alkali metal salt of carboxylic acid, classified in class 507, subclass 121.

II. Claims 21-23, drawn to a process for preparing an aqueous composition comprising a water-soluble copolymer and an alkali metal salt of carboxylic acid, classified in class 528, subclass 499+.

III. Claims 24-25, drawn to a method of carrying out a well-drilling or well-servicing operation, classified in class 166, subclass 244.1+.

IV. Claims 26-33, drawn to a water soluble copolymer having sulfonate and carboxylate groups and an aqueous well service fluid comprising thereof, classified in class 507, subclass 219+.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the process can be used to form a composition having an alkali metal salt of a carboxylic acid greater than C1 to C3, such as a soap of

a fatty acid. In addition, the composition can be formed by first dissolving the carboxylate salt first in an aqueous solution subsequently followed by dissolving the polymer in said solution.

3. Inventions IV and III are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product. See MPEP § 806.05(h). In the instant case, the process of well-drilling can be performed with any conventional drilling composition having a polymer additive containing compounds such as AMPS or acrylamide as discussed in, e.g. United States Patent Number (USPN) 4,547,299 to Lucas (col. 2, line 17-63).

4. Inventions I and II are unrelated to Inventions III and IV. Inventions I and IV are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, the water-soluble copolymer that is recited in inventions III and IV can be interpreted to comprise any sulfonate group (not necessarily AMPS) and any carboxylate group (not necessarily acrylic acid), whereas Inventions I and II are drawn to a composition comprising a copolymer derived from AMPS, or a salt thereof, and either acrylamide, vinylpyrrolidone or acrylic acid. Examiner notes that only the combination of AMPS with acrylic acid in would provide a water-soluble copolymer Groups I and II that has sulfonyl and carboxylate groups.

5. Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Mr. Peter A. McDermott on January 20, 2006 a provisional election was made with traverse to prosecute the invention of Group I, claims 13, 14, 17-20 and 34-43. Affirmation of this election must be made by applicant in replying to this Office action. Claims 21-33 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Information Disclosure Statement

8. The information disclosure statement filed on March 22, 2004 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance of EP 0645429, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. The EP 0645429 reference is in the French language. It has been placed in the application file, but the information referred to

therein has not been considered. However, a U.S. equivalent of the reference (USPN 5,484,843 to Mallo et al.) has been found, considered and cited in the attached list of references cited by the Examiner (Form PTO-892).

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 13, 19-20 and 40-43 are rejected on the ground of nonstatutory double patenting over claims 1-3 of U. S. Patent No. 6,423,802 B1 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: a composition comprising a water soluble

copolymer containing structural units formed from monomers of acrylamido-methylpropane sulfonic acid, or a salt thereof, and propanoic acid or a derivative thereof (e.g., acrylic acid); and at least one alkali metal salt of a carboxylic acid.

Drawings

11. The drawings are objected to because they appear to be informal. The background of each of Figures 1-2 is too dark making the graphs/charts difficult to interpret. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

12. Claims 13, 14 and 39 are objected to because of the following informalities: The claims recite "at least bifunctional cross-linking agent". Did Applicant intend to recite "at least *one* cross-linking agent? Appropriate correction is required.

13. Claim 18 is objected to because of the following informalities: The claim recites " ... wherein the alkali metal salt of at least one halide is selected from the sodium, potassium and cesium salts of chloride, bromide and mixtures thereof" which is confusing.

Does the claim require the alkali metal salt to have at least one alkali metal salt of each halide (chloride or bromide) or, alternatively, one halide of one alkali metal. In addition, there cannot be "mixtures" of more than one halide of an alkali metal salt.

14. Claims 31 is objected to because of the following informalities: The claim recites "*substantially* saturated brine of alkali metal carboxylate selected from sodium, potassium *and* cesium salts of acetic *and* formic acids" which is confusing. Does Applicant mean "saturated brine of *an* alkali metal carboxylate salt selected from ..."?

Moreover, does the saturated brine require to have all three of sodium, potassium and cesium salts of either acetic or formic acid; one of sodium, potassium or cesium salt of both acetic and formic acid; or alternatively one of the six possibilities of sodium acetate, sodium formate, etc.? Appropriate correction is required.

Claim Rejections - 35 USC § 112

15. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter that the applicant regards as his invention.

16. Claim 34 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim limits the plastic viscosity to "at least cPs" which is vague and indefinite.

In addition, it is also unclear as to whether the physical properties recited in the claim are of the water-soluble copolymer or, alternatively, of the aqueous composition comprising said copolymer. For example, apparent viscosity is a property of a *fluid* but the claims appear to recite it as a property of the *copolymer.*

17. Claims 37 and 40-43 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims recite the term "2-propanoic acid". Although "propanoic acid" (i.e. propionic acid) is a term in the art, the phrase "2-propanoic acid" is inconsistent with chemical nomenclature. The second carbon in a propyl group cannot be part of a carboxyl group, otherwise, it would have to be at least a butyl chain.

Moreover, if Applicant intended the term to be propanoic acid, it is not an alpha, beta-unsaturated carbonyl compound. It has one functional group (carboxyl) but no other unsaturated bond present in the compound. Thus, the term further lacks antecedence.

Consequently, the term "2-propanoic acid" is indefinite and further lacks antecedent basis.

Claim Rejections - 35 USC § 102

18. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

19. Claims 13, 17-20 and 40-42 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 4,536,297 to Loftin et al. (hereinafter 'Loftin').

Examiner notes that Loftin incorporates United States Patent No. 4,309,523 to Engelhardt et al. (hereinafter 'Engelhardt') by reference in col. 3, lines 1-2.

Examiner further notes that claim 13 reads on zero weight percent of the cross-linking agent and that the term "2-propanoic acid" in claims 37 and 40-43 was not given patentable weight due to its indefiniteness as discussed above in paragraph #17.

Loftin discloses a well drilling/completion fluid composition, having excellent stability over a broad temperature range, comprising a vinylamide-vinylsulfonate terpolymer (a copolymer formed from three monomers). (Abstract; col. 1, line 64 to col. 2, line 9; col. 2, lines 59-66; col. 19, line 7, to col. 20, line 13) Loftin further discloses that the terpolymer readily dissolves in fresh water, saltwater and/or seawater (sodium chloride which is an alkali halide) and is synthesized by reacting monomers of 2-acrylamido-2-methylpropyl sodium sulfonate (Na-AMPS), vinylacetamide and

acrylamide in accordance with the methods taught in Engelhardt, which is incorporated by reference. (Loftin, col. 2, line 59 to col. 3, line 3)

Engelhardt teaches water-soluble copolymers formed from 5-95% by wt. of 2-acrylamido-2-methyl-propane sulfonic acid or an alkali metal salt thereof, 5-95% of a vinylacylamide, and 0-80% of acrylamide; preferably 40-80 percent by weight of AMPS or a sodium/potassium salt thereof, 10-30% of the vinylacylamide and 0 to 60% of the acrylamide. (Engelhardt, col. 2, lines 33-62; col. 8, line 50 to col. 10, line 10)

Examiner notes that 2-acrylamido-2-methyl-propane sulfonic acid is commonly abbreviated as "AMPS" and, as admitted by Applicant, is also 2-methyl-2-[(1-oxo-2-propenyl)amino]-1-propane sulfonic acid. (See e.g., USPN 6,423,802 B1 to Applicant, col. 4, lines 63-67)

Loftin discloses that the composition contains an organic acid salt as a clay-stabilizing agent (or viscosity increasing agent), readily soluble in water (hydrated in an aqueous solution), brine and seawater, having cations of potassium, rubidium or cesium that react with, or otherwise prevent, water-sensitive clays from swelling and migrating. (Col. 3, lines 3-21; col. 4, lines 28-53) Loftin specifically discloses potassium formate, potassium acetate, potassium propionate, cesium formate, cesium acetate, rubidium formate, rubidium acetate (each of which is an alkali metal salt of a C_1 to C_3 carboxylic acid) and potassium butyrate as particularly suitable examples of said organic acid salt, wherein potassium acetate is preferred as a clay-stabilizing agent and can be present in 1 to 100 pounds per barrel. (Col. 3, lines 22-54)

Table 1 on col. 5-6 discloses fluid formulation properties of several sample compositions of Example 1, said fluid formulations comprising water, sea salt (sodium chloride) potassium acetate and a vinylamide-vinylsulfonate terpolymer as a fluid loss reducing agent dissolved (hydrated) in the aqueous composition. The yield point of the second sample on Table I is 6 lbs/100 ft^2. Table III on col. 7-8 discloses results for properties of Example 3 compositions having the same components as in Example I. The plastic viscosity and the yield points for the fourth sample disclosed on Table III are 25 cps and 8 lbs/100 ft^2, whereas for the fifth sample they were 50 cps and 22 lbs/100 ft^2 respectively.

Although Loftin is silent in regards to the other physical properties limitations recited in the claims such as apparent viscosity, because Loftin discloses the same copolymers and compositions comprising thereof as those encompassed by the instant claims, then Loftin's copolymers/compositions must inherently possess the same physical properties as the ones recited in the claims.

Thus, the claims are anticipated by Loftin.

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

21. Claims 13, 14 17-20 and 34-43 are rejected under 35 U.S.C. 103(a) as unpatentable over USPN 5,620,947 to Elward-Berry (hereinafter "Elward-Berry") and USPN 5,080,809 to Stahl et al. (hereinafter 'Stahl') as further evidenced by USPN 5,008,025 to Hen (hereinafter 'Hen').

Elward-Berry discloses a water-based well completion/workover fluid comprising a saturated brine solution, a sized-salt and a water-soluble filtration additive that includes a copolymer formed from AMPS, acrylamide and/or 2-vinylpyrrolidone. (Abstract, col. 3, lines 4-8 and 43-62; col. 18, lines 47-54)

The saturated brine solution can contain potassium chloride, sodium chloride, sodium bromide, potassium bromide, potassium formate, cesium formate, cesium chloride or mixtures thereof; whereas the sized-salt can be potassium chloride, sodium chloride, sodium bromide, potassium bromide, cesium chloride, cesium formate, potassium formate or mixtures thereof. (Col. 2, line 58 to col. 3, line 8; col. 18, line 55 to col. 19, line 4)

In the examples, Elward-Berry discloses using DRISCAL D® (formed from monomers of AMPS, acrylamide and 2-vinylpyrrolidone) and TEKMUD® (comprising monomers of AMPS and acrylate) as the water-soluble copolymer dissolved (hydrated) in the aqueous composition. (Col. 7, lines 17-30) DRISCAL D® is a high temperature, filtration control polymer having a high molecular weight (1-10 million) and is a copolymer of AMPS and acrylamide. (See, e.g., Hen, Example 2 on col. 4, lines 34-37)

Elward-Berry does not disclose the weight percentages of the various monomeric components of the water-soluble copolymer in general, or of DRISCAL D® or

TEKMUD® in particular. However, Elward-Berry, in col. 5, lines 13-20, does state that the water-soluble copolymer, containing AMPS, acrylamide and/or 2-vinylpyrrolidone, can be formed by known methods such as those taught by Stahl.

Stahl teaches water-soluble copolymers to be used in drilling, workover and/or completion fluids, formed from AMPS or a sodium salt thereof, vinylpyrrolidone (VP); acrylamide (Am); and/or acrylic acid or sodium acrylate. (Stahl, col. 8, lines 30-49; col. 21, lines 37-60; col. 22, lines 48-56; col. 35, lines 18-24; col. 41, lines 1-10; col. 42, lines 7-27) Stahl teaches that, in certain application there can be an advantage for the copolymer to have at least 20%, preferably 80-95% by polymer weight of Na-AMPS; 5-20% of VP; and 0-40% of the unsaturated amide. (Stahl, col. 23, lines 25-37; col. 37, lines 36-50)

Stahl also teaches that these copolymers can be prepared by combining the monomer units to attain resultant polymers having a high molecular weight and high relative viscosity (K value) so that they can be used as fluid additives in harsh environments. (Stahl, col. 9, lines 26-40) Stahl further teaches that by varying the proportion of the monomer units and thus, their molecular weights, the resulting polymers can be used for other recovery processes of natural resources. (Stahl, col. 9, lines 41-52)

Stahl further teaches that a suitable difunctional or other multifunctional monomer, such as divinylbenzene or bis-methylene-acrylamide, can be employed as a crosslinking agent in the process of the in-situ polymerization of the aforementioned copolymer. (Stahl, col. 44, lines 37-40)

Many of the experimentals in Stahl disclose various examples of copolymers formed from combining AMPS or Na-AMPS with acrylamide (Am), VP and/or acrylic acid (AA) or a salt thereof. Among the Examples disclosing these polymers are Examples XXVII-XXX, XXXII, XXXV, XXXVII-XXXVIII, XLIII, XLIV, XLV, XLVI and L. Particularly, see Table LV on col. 107-108, and Table LVIII on col. 111-112, for drilling mud compositions including a VP/Am/Na-AMPS/AA copolymer having a 30/10/55/5 weight ratio in salt water and 30/5/55/10 in fresh water respectively. Also, Stahl discloses crosslinked VP/Am/Na-AMPS co-polymers in seawater drilling compositions having weight ratios of 35/25/40 and 30/15/55. (Stahl, Table LXIV on Col. 123-124)

Although physical properties recited in the claims for the copolymer, or composition comprising thereof, may not be specifically taught in Elward-Berry or Stahl for disclosed copolymers, such as DRISCAL D® or Stahl's VP/Am/Na-AMPS/AA copolymer having a 30/5/55/10 weight ratio, because the polymers disclosed by Elward-Berry and/or Stahl are the same copolymers/compositions encompassed by the instant claims, then they must inherently possess the same physical properties, such as apparent viscosity, plastic viscosity and yield point.

Therefore, it would have been obvious to a person of ordinary skill in the art to use, as the filtration additive in Elward-Berry's well servicing fluid, DRISCAL D® (as disclosed by Elward-Berry) or one of Stahl's copolymer, such as the VP/Am/Na-AMPS/AA copolymer having a respective weight ratio of 30/5/55/10. One skilled in the art would have been motivated to, e.g., include Stahl's VP/Am/Na-AMPS/AA copolymer in the drilling fluid because the Elward-Berry reference itself refers to Stahl as the

reference that teaches how to produce the copolymers used as filtration additives in Elward-Berry's composition.

Thus, the claims are unpatentable over Elward-Berry and Stahl.

22. Claims 14 and 34-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loftin in view of USPN 5,789,349 to Patel (hereinafter 'Patel') as further evidenced by Hen.

Loftin was discussed above. Loftin is silent as to the molecular weight of the copolymer and does not disclose forming the copolymer using methylene-bis-acrylamide as the crosslinking agent.

Examiner notes that AMPS® (2-acrylamido-2-methylpropane sulfonic acid, a trademark of LUBRIZOL®, sold by NOVEON®) is defined as having a molecular weight of about 300,000 to 10 million. (See, e.g. Hen, col. 4, lines 6-11)

Patel teaches a water-based drilling fluid containing a cross-linked polymeric fluid loss control additive, said polymeric additive prepared from monomers of AMPS or salt thereof, acrylamide and N,N'-methylene-bis-acrylamide as the cross-linking agent. (Abstract; col. 2, line 48 to col. 3, line 8; col. 4, lines 38-43; col. 4, line 65 to col. 5, line 4)

Patel also teaches that this polymeric additive for aqueous fluids provides enhanced fluid control properties, particularly at high operating temperatures and pressures, while also exhibiting superior performance characteristics in the presence of salts and solids and exhibiting outstanding tolerance towards ions of sodium, chloride

and divalent cations frequently encountered in seawater drilling fluids. (Col. 1, lines 6-34; col. 2, lines 48-53; col. 4, lines 31-56; col. 5, lines 5-21)

Furthermore, Patel teaches that a high rate of polymerization of equimolar concentrations provides the highest molecular weight for the copolymer and that by manipulating suitable monomeric ratios of the copolymer (and thus, the molecular weight) can provide for the most optimal additive tailored for a desired end use. (Col. 6, lines 15-26) The amount of cross-linking agent can also be altered to provide optimally crosslinked copolymers that are neither cross-linked too highly (providing rigid and difficult to hydrate in water-base fluids) nor cross-linked too little (providing linear, long chain polymers that hydrate readily, viscosify the aqueous fluid to be adversely affected by drill solids, thus rendering the additive ineffective). (Col. 6, lines 27-49)

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to use Patel's cross-linked AMPS/acrylamide copolymer fluid reducer additive as the fluid reducing agent in Loftin's aqueous drilling fluid. One skilled in the art would have been motivated to do so in order to attain a resultant drilling fluid having a cross-linked copolymer additive that can be dissolved (hydrated) in an aqueous fluid but is still very effective as a fluid reducer in drilling operations at high temperatures and high pressures as taught by Patel.

In addition, because AMPS has a molecular weight of up to 10 million, and Patel teaches that the high rate of polymerization of the cross-linked AMPS/acrylamide copolymer with methylene-bis-acrylamide provides for the *highest* molecular weight of

the copolymers, thus it is the Examiner's position that the molecular weight of Patel's copolymer must be greater than at least one million.

Thus, the claims are unpatentable over Loftin and Patel.

23. Claims 13, 17-20 and 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,124,244 to Murphey (hereinafter 'Murphey') and USPN 4,752,404 to Burns et al. (hereinafter 'Burns').

Murphey discloses a drilling fluid comprising a blend of a salt brine and one or more additives; wherein the salt brine is substantially free of insoluble solids and the additive can be a fluid loss control polymer or a soluble (hydrated in aqueous solution) viscosifying polymer, such as a copolymer of AMPS with acrylamide and/or acrylic acid. (Abstract; col. 1, line 56 to col. 2, line 2; col. 2, lines 19-39; col. 3, line 58 to col. 4, line 16)

Murphey discloses that the soluble salt that is used to provide salinity to the brine can be sodium chloride, sodium formate, potassium formate, cesium formate, sodium bromide or combinations thereof and in Examples 1-7 discloses compositions including a salt brine, water with blends containing the aforementioned AMPS copolymer. (Col. 3, lines 35-41; Examples 1-7)

In Tables 2 and 4 on col. 7-8, Murphey discloses samples of these compositions containing a salt brine and the AMPS copolymer having a yield point greater than 5 lb./100 ft^2; an apparent viscosity of at least 20 cps and a plastic viscosity greater than 15 cP. (Samples Fluids A-G at rpm greater than 30)

Examiner notes that, although Murphey does not specifically disclose the weight percentages of the monomers of the AMPS copolymer composition, Murphey discloses that the blends of copolymers used in Examples 1-7 were prepared in accordance with Burns. (Table 1, col. 6, lines 40-41 and 53-55)

Burns teaches blends including a water-soluble (hydrated in aqueous solutions) AMPS copolymer that are used to increase the viscosity of aqueous acidic solutions, wherein the blend can contain one or more water-soluble copolymer having various ratios of AMPS or a salt thereof with acrylamide or acrylic acid, and wherein the preferred weight ratios for the acrylamide/(AMPS or Na-AMPS) copolymer are 50:50 and 30:70. (Burns, Abstract; col. 1, lines 30-58; col. 2, lines 23-32; Example II)

Burns further teaches that a blend including one or more of the aforementioned AMPS water-soluble copolymers can produce a synergistic increase in the viscosity of an aqueous acidic solution when compared to other viscosifying additives that contain an AMPS copolymer. (Burns, col. 1, lines 55-67) Consequently, these blends are particularly suitable for hostile environments, such as at high temperatures, hard brines and at a pH as low as 1, that require highly viscous fluids. (Burns, col. 3, lines 1-26)

In addition, Burns teaches that the water-soluble copolymer can be cross-linked and can contain 0-5% of a cross-linking agent (col. 2, line 41-67; Table 1 on col. 2); and further teaches examples wherein the copolymer blend provide an acidic aqueous composition with an apparent viscosity of 21, 22, 24 or 30 (Table II on col. 4-5).

Accordingly, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to use Burns AMPS copolymer blend as the

viscosifying polymer additive in Murphey's drilling fluid composition. It would have been within the purview of one in the art to do so in order to attain a resultant drilling fluid that is more effective when used in hostile environments such as at high temperatures, hard brines or low pH as taught by Burns.

Although Murphey and Burns may be silent in regards to other physical property limitations of the copolymer/composition recited in the claims, because Murphey and Burns disclose the same copolymers and compositions comprising thereof that are encompassed by the claims, then Murphey and Burn's copolymers/compositions must inherently possess the same physical properties as those recited in the claims.

Thus, the claims are unpatentable over Murphey and Burns.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Figueroa whose telephone number is (571) 272-8916. The examiner can normally be reached on Mon-Thurs & alt. Fri 8:00-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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RAG/JJF

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